

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (currently amended) An electrochemical cell having a membrane electrode assembly (MEA) comprising an anode and a cathode, the cell comprising:

an electroconductive element comprising an impermeable electrically conductive element having a major surface facing the cathode, and an electrically conductive porous liquid distribution media disposed along said major surface defining flow channels comprising lands and grooves ~~at said major surface~~ for transporting gas and liquid to and from the cathode;

an electrically conductive fluid distribution layer disposed between said liquid distribution media and the cathode for transporting gases and liquids between the cathode and said flow channels; said fluid distribution layer and liquid distribution media constructed and arranged to transport liquids accumulating within the cathode through said fluid distribution layer and to and through said liquid distribution media, wherein said liquid distribution media contacts said fluid distribution layer in regions corresponding to said lands to form ~~forms~~ an electrically conductive path between said impermeable electrically conductive element and said conductive fluid distribution layer, and wherein said fluid distribution layer is porous and has an average pore size larger than an average pore size of said porous liquid distribution media.

2. (original) The electrochemical cell of claim 1, wherein said impermeable electrically conductive element and said liquid distribution media are arranged together to define said flow channels.

3-4. (cancelled).

5. (previously presented) The electrochemical cell of claim 1, wherein said liquid distribution media is more hydrophilic than said fluid distribution layer.

6. (cancelled).

7. (currently amended) The electrochemical cell of claim 1, wherein said liquid distribution media is disposed in regions along said major surface corresponding to an electrically active area defined by the MEA ~~defining separate spaced-apart flow channels at each of said respective regions.~~

8. (currently amended) The electrochemical cell of claim 1, wherein said impermeable electrically conductive element is planar and a body of said liquid distribution media defines ~~has~~ an undulated configuration of peaks and valleys, wherein said peaks correspond to said lands and said valleys correspond to said grooves which constitute said flow channels.

9. (currently amended) The electrochemical cell of claim 1, wherein said porous liquid distribution media has an average pore size in the range of from about 0.2 to about 30 micrometers ~~microns~~.

10. (original) The electrochemical cell of claim 1, wherein said liquid distribution media internally re-distributes liquid water thereby minimizing differences in humidity along a face of the MEA.

11. (original) The electrochemical cell of claim 1, wherein said electroconductive element comprises a second impermeable electrically conductive element having a second surface facing the anode and a second liquid distribution media that is attached along regions of said second surface, and a second fluid distribution layer is disposed between said electroconductive element and the anode, wherein said second liquid distribution media contacts said second fluid distribution layer.

12. (previously presented) The electrochemical cell of claim 1, wherein said liquid distribution media comprises a first and a second layer wherein said first layer is in contact with said impermeable electrically conductive element and said second layer is in contact with said fluid distribution layer wherein said second layer is more hydrophilic than said first layer.

13. (withdrawn) The electrochemical cell of claim 1, wherein said liquid distribution media comprises a first and a second layer wherein said first layer is in contact with said impermeable electrically conductive element and said second layer is in contact with said fluid distribution layer wherein said first layer has a larger average pore size than said second layer, such that liquid is transported at a higher rate in said first layer than in said second layer.

14. (withdrawn) The electrochemical cell of claim 1, wherein said liquid distribution media has a first surface and a second surface, said first surface is in contact with the fluid distribution layer and has an undulating surface that corresponds to said flow channels, wherein said second surface is opposite to said first surface and meets with a surface of said impermeable electrically conductive element and is planar.

15. (previously presented) The electrochemical cell of claim 1, wherein said liquid distribution media is selected from the group consisting of: mesh, screen, and foam.

16. (original) The electrochemical cell of claim 1, wherein said liquid distribution media is constructed of material selected from the group consisting of: carbon, graphite, polymers, stainless steel, chrome and alloys and mixtures thereof.

17. (original) The electrochemical cell of claim 1, wherein said liquid distribution media is formed of materials that are cast, coated, or sprayed onto said major surface.

18. (original) The electrochemical cell of claim 1, wherein said liquid distribution media comprises a conductive polymer or a non-conductive polymer with conductive particles distributed therein.

19. (original) The electrochemical cell of claim 18, wherein said liquid distribution media is cured by application of heat.

20. (previously presented) The electrochemical cell of claim 1, wherein said liquid distribution media comprises a plurality of conductive metal particles selected from the group consisting of: stainless steel, niobium, nickel-chromium-iron alloy, and mixtures thereof.

21. (original) The electrochemical cell of claim 20, wherein said liquid distribution media is formed by sintering said plurality of conductive metal particles by application of heat.

22. (original) The electrochemical cell of claim 1, wherein said impermeable electrically conductive element comprises a compound selected from the group consisting of: aluminum, titanium, stainless steel, and alloys and mixtures thereof.

23. (original) The electrochemical cell of claim 1, wherein said liquid distribution media is formed by etching said major surface.

24-50. (cancelled).

51. (currently amended) An electrochemical cell having a membrane electrode assembly (MEA) comprising an anode and a cathode, the cell comprising:

an electroconductive element comprising an impermeable electrically conductive element having a major surface facing the cathode, and an electrically conductive porous liquid distribution media disposed along said major surface defining flow channels comprising lands and grooves ~~at said major surface~~ for transporting gas and liquid to and from the cathode;

an electrically conductive fluid distribution layer disposed between said liquid distribution media and the cathode for transporting gases and liquids between the cathode and said flow channels; said fluid distribution layer and liquid distribution media constructed and arranged to transport liquids accumulating within the cathode through said fluid distribution layer and to and through said liquid distribution media, wherein said liquid distribution media comprises a first layer and a second layer arranged so that said first layer contacts said impermeable electrically conductive element and said second layer contacts said fluid distribution layer in regions corresponding to said lands to form ~~wherein said liquid distribution media has an average pore size of about 0.2 to about 30 microns and forms~~ an electrically conductive path between said impermeable

electrically conductive element and said conductive fluid distribution layer, and wherein said fluid distribution layer is porous and has an average pore size larger than an average pore size of said second layer of said porous liquid distribution media, and said first layer of said liquid distribution media is less hydrophilic than said second layer.

52. (cancelled).

53. (previously presented) The electrochemical cell of claim 51, wherein said impermeable electrically conductive element and said liquid distribution media are arranged together to define said flow channels.

54. (cancelled).

55. (currently amended) The electrochemical cell of claim 51, wherein said liquid distribution media is disposed in regions along said major surface corresponding to an electrically active area defined by the MEA ~~defining separate spaced-apart flow channels at each of said respective regions.~~

56. (currently amended) The electrochemical cell of claim 51, wherein said impermeable electrically conductive element is planar and a body of said liquid distribution media defines ~~has~~ an undulated configuration of peaks and valleys, wherein said peaks correspond to said lands and said valleys correspond to said grooves which constitute said flow channels.

57. (previously presented) The electrochemical cell of claim 51, wherein said liquid distribution media is selected from the group consisting of: mesh, screen, and foam.

58. (previously presented) The electrochemical cell of claim 51, wherein said liquid distribution media is constructed of material selected from the group consisting of: carbon, graphite, polymers, stainless steel, chrome and alloys and mixtures thereof.

59. (previously presented) The electrochemical cell of claim 51, wherein said liquid distribution media is formed of materials that are cast, coated, or sprayed onto said major surface.

60. (previously presented) The electrochemical cell of claim 51, wherein said liquid distribution media comprises a conductive polymer or a non-conductive polymer with conductive particles distributed therein.

61. (previously presented) The electrochemical cell of claim 60, wherein said liquid distribution media is cured by application of heat.

62. (previously presented) The electrochemical cell of claim 51, wherein said liquid distribution media comprises a plurality of conductive metal particles selected

from the group consisting of: stainless steel, niobium, nickel-chromium-iron alloy, and mixtures thereof.

63. (previously presented) The electrochemical cell of claim 62, wherein said liquid distribution media is formed by sintering said plurality of conductive metal particles by application of heat.

64. (currently amended) An electrochemical cell having a membrane electrode assembly (MEA) comprising an anode and a cathode, the cell comprising:

an electroconductive element comprising an impermeable electrically conductive element having a major surface facing the cathode, and an electrically conductive porous liquid distribution media disposed along said major surface defining flow channels comprising lands and grooves ~~at said major surface~~ for transporting gas and liquid to and from the cathode;

an electrically conductive fluid distribution layer disposed between said liquid distribution media and the cathode for transporting gases and liquids between the cathode and said flow channels; said fluid distribution layer and liquid distribution media constructed and arranged to transport liquids accumulating within the cathode through said fluid distribution layer and to and through said liquid distribution media, wherein said liquid distribution media contacts said fluid distribution layer in regions corresponding to said lands to form an electrically conductive path between said impermeable electrically conductive element and said conductive fluid distribution layer

and wherein said liquid distribution media comprises a material selected from the group consisting of: mesh, screen, foam, and sintered metal.

65. (currently amended) The electrochemical cell of claim 64, wherein said liquid distribution media comprises a first and a second layer wherein said first layer is in contact with said impermeable electrically conductive element and said second layer is in contact with said fluid distribution layer in regions corresponding to said lands, wherein said second layer is more hydrophilic than said first layer.

66. (previously presented) The electrochemical cell of claim 64, wherein said impermeable electrically conductive element and said liquid distribution media are arranged together to define said flow channels.

67. (cancelled).

68. (currently amended) The electrochemical cell of claim 64, wherein said liquid distribution media is disposed in regions along said major surface corresponding to an electrically active area defined by the MEA ~~defining separate spaced-apart flow channels at each of said respective regions.~~

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69. (currently amended) The electrochemical cell of claim 64, wherein said impermeable electrically conductive element is planar and a body of said liquid distribution media defines ~~has~~ an undulated configuration of peaks and valleys, wherein

said peaks correspond to said lands and said valleys correspond to said grooves which constitute said flow channels.

70. (previously presented) The electrochemical cell of claim 64, wherein said liquid distribution media is constructed of material selected from the group consisting of: polymers, stainless steel, chrome and alloys and mixtures thereof.

71. (previously presented) The electrochemical cell of claim 64, wherein said liquid distribution media is formed of materials that are cast, coated, or sprayed onto said major surface.

72. (previously presented) The electrochemical cell of claim 64, wherein said liquid distribution media comprises a conductive polymer or a non-conductive polymer with conductive particles distributed therein.

73. (previously presented) The electrochemical cell of claim 72, wherein said liquid distribution media is cured by application of heat.

74. (previously presented) The electrochemical cell of claim 64, wherein said liquid distribution media comprises a plurality of conductive metal particles selected from the group consisting of: stainless steel, niobium, nickel-chromium-iron alloy, and mixtures thereof, that are sintered to form said liquid distribution media.

75. (new) The electrochemical cell of claim 51, wherein said liquid distribution media has an average pore size of about 0.2 to about 30 micrometers.